

Transportation
Land
Development
Environmental
Services



Kilton Road
Six Bedford Farms, Suite 607
Bedford, New Hampshire
03110-6532
603 644-0888
FAX 603 644-2385

Attendees SEE ATTACHED LIST Date/Time: October 18, 2000, 4:00 PM

		Project No.:	Salem – Manchester 50885 10418-C
Place:	Running Brook School, Derry NH	Re:	Resource Agency Meeting #9-I-93, Ridership Projections
		Notes taken by:	Bruce Tasker; Revised by Jeff Brillhart

Charlie Hood opened the meeting and discussed the coordination process that being used to review the I-93 project with the Resource Agencies.

Jeff Brillhart introduced members of the Department's project team.

The Resource Agency representatives in attendance then introduced themselves.

Jeff noted the meeting today is a continuation of discussions begun in August relative to ridership on alternative modes of transportation (i.e., train service, bus service and the use of high occupancy vehicle lanes and how these mode options could influence the improvements needed for I-93). A second topic for today's meeting is Induced Travel. It is a relatively new way of looking at transportation improvements and the question is what exactly is it, how do you analyze it, and how should it be addressed as part of this project.

Howard Muise explained that at previous meetings, we have discussed the mode options (rail, bus, and HOV) potentially available, the various combinations of mode options and highway options that make up ten generic alternatives, and the ridership volumes and highway level of service that result based on the analysis. Howard then reviewed the attached handout relative to conclusions that might be reached regarding the mode options.

Marty Kennedy then discussed the associated traffic analysis, and conclusions that appear evident regarding the highway needs, again from a transportation perspective. In summary, they

explained the very broad conclusions reached thus far. First, the various transit or HOV options, either singularly or in combination with each other, do not reduce the number of additional travel lanes that are needed on I-93. That is the traffic analysis indicates that the various mode options, however they are packaged, do not result in traffic reductions that are sufficient to eliminate the need for improvements to the highway.

Secondly, the mode option that is the most effective, is the Enhanced Rail Corridor which is located in the median of I-93 in NH and travels to the Woburn Transportation Center in Massachusetts. From there, riders can take train service into downtown Boston. This service also provides stops to employment centers along I-93 in northern MA. It does require extensive infrastructure investments by MA, which will be considered as part of the I-93 corridor planning study being done in Massachusetts. The Massachusetts study involves I-93 Methuen and Andover, which is where the highway is three-lanes in each direction, although it currently is operating as a four-lane highway during the peak hours through the use of the shoulders for travel during peak periods. The Massachusetts study is just getting underway and will probably take a year.

The second mode option that is almost as effective as the Enhance Rail Corridor option is bus service, (Expanded and Enhanced Bus Service) in combination with an HOV lane. The HOV lane will provide faster routes for buses, which will get them out of the general traffic lane and provide reasonably rapid service to downtown Boston. As with the Enhanced Rail, this option provides service to northern MA employment centers as well as to downtown Boston. Again, as with the rail option, this alternative would require coordinating improvements in northern MA to provide for HOV lanes into MA.

Other conclusions and issues for consideration as a result of this study thus far include: The Enhanced Rail option generates the highest level of rail ridership and involves substantial coordination with, and investment from, Massachusetts. It also may offer Massachusetts substantial benefits. The East Rail Corridor service and the I-93 Basic Rail service carries riders to Lawrence, who then transfer to the Haverhill line in order to get into downtown Boston. The two services generate about the same level of ridership, but only 1/3 to 1/2 of the ridership of the Enhanced Rail Corridor because they don't provide service to the employment centers along the I-93 corridor in northern Massachusetts.

The fourth rail option that was looked at is the West Rail Corridor, which involves extending rail service from Nashua to Manchester. The West Rail option would generate the least ridership in terms of affecting the I-93 corridor. Basically the West Rail Corridor option would serve the US 3/ FEE Turnpike corridor, and would only affect the I-93 traffic volumes by drawing ridership from the Manchester area.

Relative to HOV lanes, an HOV lane limited to just NH will not be effective in generating new carpools or enticing commuters to travel in high occupancy vehicles. The principal reason for this is that the distance covered by the facility is not enough to generate sufficient travel timesavings to result in a meaningful shift from single occupancy vehicles (SOV) to high occupancy vehicles. Similarly, HOV lanes in NH only do not generate enough of a saving in terms of bus travel time to substantially increase bus ridership. If however, the HOV facility is extended into MA through the congested part of I-93 all the way down to the Woburn Transportation Center, then sufficient travel timesavings can be generated so that SOV's can be reduced. However, even with an HOV lane in both MA and NH, the results are somewhat marginal in terms of the number of HOV's that would use the lane. Based on studies by the Texas Transportation Institute, a minimum operating threshold (i.e. the minimum volume in the lane needed to justify the lane) range from about 400 to 800 vehicles per hour. The 400-vehicle threshold is generally used for highways where you have 3+ HOV's (high occupancy vehicles that carry three or more people), which translates into about 1,200 people per lane per hour. The 800-vehicle threshold is generally

used for highways where you have 2+ HOV's, which translates into 1,600 people per lane per hour. These minimums are established guidelines, for without achieving these minimum ridership levels, the HOV lane will be perceived by those in the general use lane as being "empty" and they will lobby to convert the HOV lane into a general use lane. It should also be noted that the volumes in the HOV lane are still less in the hour before and the hour after the peak hour, further contributing to the perception that the lane is empty or unproductive. In addition, in the opening year (say 2010) the HOV volumes would be less than those shown for the design year, again contributing to the perception that the lane is not well used. The 2+ occupancy requirement was assumed for NH, as 3+ occupancy requirements nationwide is very difficult to maintain. However, the study indicates that the 800-vehicle threshold is only met at the extreme southern end of the corridor south of Exit 1. Between Exits 1 and 2, the HOV volume is projected to be fewer than 800. As you go farther north, the HOV volumes continue to decline. At the extreme northern end of the corridor the 400 vehicles per hour volume (the minimum-operating threshold of a 3+ facility) is not met. In terms of generating enough HOV volume to justify providing an HOV lane, is a very marginal situation even with the facility extending into MA.

The configuration for the HOV lane is proposed to be a concurrent flow lane which means the lane is adjacent to the general purpose lane separated by an extra wide painted 4' buffer. The concurrent flow HOV lane would have 14-foot wide shoulder adjacent to provide for cars that break down and where police would enforce restrictions placed on the HOV lane. However, because the HOV lane is not physically separated from adjacent traffic stream, there may be operational problems in terms of vehicles moving in and out of the lane, particularly if there are large differences in travel speed between the general purpose lane and HOV facility. Also, because it is on the left side of the roadway, as you get in or out of the lane, you have to cross all of the general-purpose lanes, again potentially creating operational problems for the highway as well as the HOV lane. One of the benefits of an HOV facility is that it enhances bus service and increases bus ridership by improving travel time and reliability over that available to SOV's. The combination of Enhanced Bus Service (that is the service to northern MA), Expanded Bus Service (that is service from Manchester, Exit 5, 4, 3, and 2 to downtown Boston) and an HOV lane generates almost as much ridership as the Enhanced I-93 Rail Corridor. The Enhanced I-93 Rail Corridor option and a bus/HOV combination option provide essentially the same service and compete for the same potential pool of transit users and consequently generate approximately the same numbers of trips.

Finally, having the HOV lane extend into Massachusetts increases bus ridership substantially. Having an HOV lane just in New Hampshire greatly reduces the effectiveness of any bus service, provided.

With the handout is a table that summarizes some of the ridership and traffic volumes which were derived from the analysis, which is helpful for making comparisons. The table shows 2020 SB (one direction) daily ridership and traffic volumes south of Exit 1. This shows the southbound volumes, but similar volumes are expected to travel northbound. The first three alternatives focus on rail. The Enhanced Rail Service to northern MA shows the largest volume of rail ridership. The West Rail service shows a fairly limited ridership, because there is only two stations (Bedford and Manchester) that would service riders that would otherwise drive on I-93. The table shows that the East Rail ridership is only about a third of the I-93 Enhanced Rail ridership which reflects the more limited market served by the East Rail option as compared to the I-93 Enhanced Rail option.

The total transit riders are shown in the 8th column. To begin the calculation to determine the number of vehicles which transit and HOV use might remove from the highway (to ultimately estimate the number of vehicles the highway must continue to service with any particular combination of options, i.e., alternative), the total transit ridership must be reduced by the number of riders that might be expected to use the existing bus service if no highway

improvements or mode options were implemented. The number of riders that might be expected to use the existing bus service is calculated to be 853. The remaining transit riders (diverted person trips) is then converted to the number of vehicles diverted or removed from the highway. The same process is done for the four HOV alternatives; that is determine the number of people who would be diverted from riding alone in a car to riding in a carpool. There are existing HOV's and they would be able to use the HOV lane but the investment in HOV lanes is intended to create additional carpooling. The additional ridership is then converted to the number of vehicles that would be removed from the highway. The total number of vehicles removed is then compared with the total number of vehicles expected to travel I-93 southbound south of Exit 1.

- Ken Kettenring. Why did four of the alternatives include the West Rail option; whereas only one alternative includes the East Rail option? Why not have the alternatives that include combination of Expanded Bus Service and East Rail Service or Expanded Bus Service, Enhanced Bus Service, and Enhanced Rail Service?
- Howard Muise. The reason we looked at the West Rail was that we felt that the East Rail is located very close to the I-93 corridor and would compete with the Enhanced Rail or Enhanced and Expanded Bus, for riders, where the West Rail was located farther away and would not draw from the same pool of potential riders. The intent has been to develop combinations that would maximize the number of vehicles diverted from the highway.
- Mike Fitzgerald. It would seem to me that there are significant ridership markets for both bus service and rail service together within the area served by I-93. I think we need to study alternatives that include both services, and not just assume they would compete with each other.
- Ken Kettenring. Similarly, there is no alternative with either East Rail or Enhanced Rail combined with HOV.
- Howard Muise. Those specific options are not developed for the reason I mentioned before about the mode options competing for the same limited market of riders.
- Rosemary Monahan. I can see your point about the modes competing for the same riders, but wouldn't it make sense to look at HOV, and not necessarily for bus, but for carpooling along with the Enhanced Rail? They are not really in competition with each other.
- Howard Muise. The HOV facility in terms of creating carpools is not necessarily in competition with rail. However, the idea of the HOV facility is to not only encourage carpooling, but also to enhance bus ridership where we have bus service such as in the I-93 corridor. Again, if you have bus service and rail service in the corridor, they will compete for the same pool of people that travel the corridor.
- Ken Kettering. Don't you think that bus and rail would compliment one another? Usually they do.
- Howard Muise. Not if they are providing service from the same place to the same place. The ridership volume for one service based on one alternative is not additive with the ridership volume for another service based on another alternative. The people available for one service are very much the same people for another service. So if you combine these mode options, you are

not going to get double the people getting out of their cars and off the highway.

Ken Kettenring. But on the other hand, if you have an East Rail or and Enhanced Rail focused on getting people to Boston quickly, there would still be a benefit to having Enhanced Bus Service to take people from various NH locations to various locations on I-495 and MA128. In addition, you could have Enhanced Bus Service to rail stations and similar service on the other end to employment centers in MA. The main point that I am trying to make is we have 10 alternatives, but they seem to be too limited to convince me that any one of them are necessarily the best solution. There are many possible combinations beyond what has been identified here. I think there are other alternatives that need to be considered.

Rich Roach. You talk about the HOV not really attracting people to the HOV lane. Have you thought about making the highway a toll facility with the cost dependent on the number of occupants in the vehicle and the time of day? The toll could help pay for the facility and be a disincentive to drive alone in your car. I am not saying it is necessarily a great idea, but I think it is something that needs to be at least thought about.

Butch Waidelich. If you are talking about making the whole mainline a toll facility interstate, you need to get involved with certain special pilot programs. Interstate Funds cannot be used to create a toll on the interstate. There is one program out there that allows you to implement tolls, but the implementation can only involve construction that maintains or rehabilitates an interstate using the same number of lanes. You would not be able to expand the capacity of the highway as part of implementing tolls.

Rich Roach. TEA 21 doesn't allow that?

Butch Waidelich. Typical interstate funding cannot be used to implement tolls on an interstate. There are options to toll HOV lanes (which are called HOT lanes, High Occupancy Tolls) called value pricing or congestion pricing. What that does, is allows you to toll vehicles in the HOV lane during the peak period that have one person in the vehicle. This allows for the HOV lane to carry more vehicles. It is an option, but you don't want the HOV lane to be congested, and it won't raise a significant amount of revenue.

Mike Fitzgerald. How do we have a toll facility on I-93 now?

Butch Waidelich. I imagine the tolling was there prior to the designation of an Interstate and built probably without interstate funds.

Jeff Brillhart. That section is technically not on the interstate and is funded by Turnpike funds, not by regular I-93 interstate funds. I can also assure you that tolls in NH are not very well accepted. A number of people in the State are intent on eliminating the tolls in NH. Thinking that we are going to introduce tolls on I-93 is probably not realistic.

Rosemary Monahan. When you look at ridership first, you take into account two things; time and money. I know we are going to talk about the time piece next when we talk about induced travel, but the cost piece, at the last meeting, one of

the questions I had was whether you had looked at how sensitive the mode split was to how expensive driving was, for example, parking costs, gas cost, etc., It was stated that some analysis was done. Can you discuss that today? Say if the cost of driving were 20% higher than your assumptions, how would that affect the number of people that might switch to transit? Can you provide some sense of that?

Ken Kettenring. Parallel to that, you talk about subsidies for buses, but you never talk about what would happen if trains were subsidized. How will much higher subsidies affect the ridership?

Howard Muese. The analysis of the rail has a subsidy built into it; that is the fare structure that we use for our analysis is the fare structure used by the MBTA and that is a pretty extensive subsidy for MBTA riders on the system. We did look at a bus subsidy for some of these alternatives, and basically what we did is, we made that subsidy equivalent to the rail subsidy. So that, instead of paying a \$10.00 fare from Manchester, you pay \$3.00 or \$4.00.

We did do a sensitivity analysis where we looked at changing the cost of parking in downtown Boston and the out of pocket cost of driving. We did this analysis on East Rail corridor (and as this was done early in the ridership analysis, it was done with the assumption that the I-93 is widened to 4-lanes). The initial analysis was based on \$5.00 per day parking, \$25.00 per hour as the value of time, and out of pocket costs of driving of \$0.20 per mile. Each test was done individually. Changing the parking to \$10.00 per day increased the ridership from 957 to 1,543. Increasing the parking to \$15.00 per day, increased the ridership from 957 to 2,126.

As previously presented, the \$5.00 cost is an average cost for parking, so it includes people who don't pay for parking because of a subsidy by their employer, or people who park in South Boston where parking is only \$6 to \$7.00 per day. The average also reflects people who carpool and who share the cost of parking with others. If you just drive into town and park in the middle of the day, \$5.00 is not a realistic cost. But commuters on average pay less than people that go into town on an occasional basis.

Rosemary Monahan. I think this is very interesting, I think this helps us in understanding how much of a difference you can make in terms of ridership based on those assumptions. Did you do the same thing for the Enhance Rail? That is the option that is picking up the most number of riders.

Howard Muese. We only ran this sensitivity analysis for the East Rail Corridor. We also tested a lower value of time. Initially \$25.00 per hour was used. That cost may seem high, but we were assuming we were talking about people that principally are working in downtown Boston with a fairly high wage. We also tested \$20.00 per hour and got an increase in ridership, as well. Also tested was a change in the cost of driving from \$0.20 per mile to \$0.25 mile and that increased the ridership from 950 to about 1,200.

Rosemary Monahan. What is your sense of if you ran the same analyses for the Enhanced Rail, how much of a difference would there be in these kinds of changes for the ridership?

- Howard Muisse My expectation is that you might see the same sort of percentage increases. Part of what you have to be careful of is that there is an upper limit on how many people you are going to capture. I don't know how close we are to the limit with this sensitivity analysis. But, if you look at the people going into downtown Boston, a lot of the people that are on the I-93 corridor are not going to downtown Boston. We could change the parameters, but at some point you will get diminishing returns because you have captured most of the people in the market area. A lot of traffic on the corridor are going elsewhere. And similarly, with the people going to northern MA, there are limitations to the capture rate.
- Rosemary Monahan. It would be great if we could get copies of the assumptions and sensitivity analysis that you have run.
- Linda Wilson. Any thoughts on extending the study northward as far as Concord and using that catchment area. It seems if any of these alternatives are constructed, they are going to basically influence Concord because timewise commuters that may have thought Manchester was the northern limit for a reasonable commute, may find it attractive to now commute from as far away as Concord.
- Howard Muisse. The analysis that we did sets up catchment areas for the stations, so the Manchester station would include Manchester and some surrounding areas. It does not include Concord. There is an assumption that people will drive a certain distance to get to the station, but beyond that they are not going to bother to change modes. I guess the solution would be to extend service further to the north, and that has not been looked at.
- Mike Fitzgerald. What are the destination points in MA?
- Howard Muisse. Boston is a concentrated destination. Other areas are the employment centers along I-93. There are also a lot of people going to I-495 and down to MA128. The more destinations you have, the more difficult it is to provide transit services to all the destinations. The focus is downtown Boston which is the logical place for transit. The Enhanced services are trying to capture the more immediate destinations right along the I-93 corridor.
- Rich Roach. Maybe we ought to stop worrying so much about a couple of lanes of pavement, and start worrying about how we are going to fix the automobile to reduce problems like air pollution and water quality issues. This project has 20 acres of wetland impacts, if I understand that correctly. Frankly, the ACOE is not going to require an analysis of alternative modes for this project.
- Ken Kettenring. I am not sure that the alternative analyses at this point covers enough of the possibilities and the range of possibilities to meet the requirements of state law. I would be concerned about using the alternatives analysis that has been done to date to make a finding that any of the alternatives is the least impacting solution. I would also be concerned if I got an appeal similar to the one I got on the Keene Bypass which is challenging traffic studies and alternatives analyses there. I think the Department made the right decision in approving it. Here I am not sure yet, and I think I would

have a hard time justifying and defending the decision based on this alternatives analysis as it stands today.

- Rosemary Monahan. What we haven't discussed yet, but we will over time, is not so much about the direct impacts, but about the secondary impacts. That is, if the highway is widened, how is land use going to change in the area served by this road?
- Ken Kettering. It seems to me, in a lot of ways, NH is now about the way Los Angeles was in 1960 when they were getting rid of all of the public transportation and replacing it with the freeways. LA has basically become unlivable. I feel like we are going backwards when I see the direction that we are heading toward with this project. I doubt that in 2020 we will be able to get gas for only \$1.60 per gallon, and that air pollution from cars may be considerably worse. I think, if we are talking about 2020, we should be taking a much broader perspective relative to the transportation picture. I think from the point of view of New Hampshire's economic viability, it is important that we have a transportation system that will effectively provide good transportation. I think that we are too narrowly focused at this point on solving the problem of how are we going to be moving people from southern NH to Boston in the year 2020.
- Kate Hartnett. I would like to follow up on that. Today's Wall Street Journal has an article that says in Atlanta, which certainly is not NH, road building in the traditional sense is ending and they are now working on programs that will change the commuting habits of 20% of the area workers. Similar initiatives are being done around the country to change commuting habits to reduce congestion.
- Leigh Komornick. From the standpoint of the timing of this project, when did the traffic volumes on I-93 warrant an additional lane?
- Jeff Brillhart. I don't know the year, but certainly we passed it a long time ago.
- Leigh Komornick. When we are talking about building a new road, we need to be talking about trying to make the road safe. I am going to keep pushing on this point, but I don't hear anyone talking about safety. I think safety is important because a number of people die on I-93.
- Mike Fitzgerald. I would like to note that it is a valid viewpoint. I also think the environmental impacts and the societal impacts of induced traffic volumes, air pollution, wetland impacts, etc., need to be balanced against this issue of safety. Statistics show that accidents are not increasing based on the information in the Scoping Report published by the NHDOT. From 1995 to 1999, accidents are in the range of 253 to 292, ranging up and down, but there is not a steady increase in accidents. I am not sure of the number of fatalities. There are 60,000 people who die prematurely annually from air pollution-related diseases. That needs to be weighed also. I think accidents on I-93 are high profile problems that get a lot of news, but we have insidious environmental impacts that probably have significantly more impact from a health standpoint in terms of death and that need to be weighed just as carefully.
- Comment. When do those numbers get tied into the project?

Mike Fitzgerald. The purpose of these meetings is for the resource agencies to consider this perspective. It is the NHDOT's charge to address societal impacts and transportation. Our charge as environmental agencies is to look at the other impacts.

Jeff Brillhart then asked that discussion be focused in the mode of induced travel and introduced Marty Kennedy.

Marty Kennedy. Induced Travel is a fairly new concept that suggests that if you add capacity to the transportation system, that additional capacity encourages additional travel. Because it is new, it is not widely understood and is certainly not widely accepted at this point. We need to make some determinations as to what exactly induced travel is.

In general, induced travel is based on the economic principle of supply and demand. That is, if you increase the capacity of the highway (which is the supply), you decrease the travel time (or the cost of travel), and in doing so you increase demand. If the cost were less, more people would buy it. If the travel time is less, more people will travel. The real problem is quantifying that effect. When you look at it from this standpoint of supply and demand, intuitively it makes sense. The question is how do you isolate that one component which is Induced Travel from all the other factors that affect why traffic increases; such as population increases, changes in demographics, higher incomes, technological changes, cultural changes, etc.

We need to understand what component will specifically be increasing the capacity of the system. In an effort to quantify that component, researchers propose that there is an elasticity to the demand with respect to capacity. There have been some studies and research papers over the last couple years on that subject to try and determine what that elasticity is. We have looked at some of these papers and there is a wide range of different elasticities being proposed. I think it is fair to say that, at this point, the research is very much still in the developmental stage, and will be ongoing for a number of years before there is a full understanding what the elasticity's are and how the issue of Induced Travel will be quantified. The elasticity's may eventually be proposed in terms of ranges and potentials.

There is a FHWA spreadsheet called SMITE that provides a fairly crude methodology to estimate and quantify the effect of induced growth. We have looked at this spreadsheet and conducted test runs in an effort to understand the methodology and the magnitude of the volume. The issue essentially comes back to the elasticity factor. For a given elasticity, you get certain range of induced travel volumes. How realistic they are and what implications they have relative to the project is not clear.

Let's assume we can quantify or determine some range as to what the induced growth is. Current traffic models used in projecting traffic for the studies like I-93 are making estimates of future traffic growth based in part on some type of forecast relative to land use. With each model there is a connection between land use and trips, and for the future projections some type of assumption is made as to what the land use growth will be. The

traffic models typically make those projections on land use independent of the capacity of the roadway. So in effect, the models are assuming the growth will happen, and the growth is not necessarily constrained because there is not enough capacity on the road. This means that if the traffic model input projections were done accurately, then traffic output projections for a build condition should be accurate and should include the Induced Growth volume as it pertains to lane use. In fact it would be the traffic output projections for the No-Build condition that might be overestimated by including Induced Growth volumes based on overly optimistic land use conditions for the No-Build condition. It makes sense that the No-Build condition and Build condition should not be the same. The question is which one is high. I should point out that current traffic models account for such things as the diversion of traffic which is one type of induced travel. Diversion of traffic is if you have parallel roads and you provide more capacity on one road motorists will choose to move from one road to another. The one type of induced travel that we don't account for is if you add more capacity to the system, will trip lengths be lengthened and to what extent and how many trips are affected.

At this point, we have made our best effort at trying to look at all the most recent research. We have tried to make some recommendations to the Department as far as how do we proceed relative to this issue. We believe induced travel is an important issue and decision makers need to be aware of the potential ramifications of upgrading I-93 might mean as far as the issue of induced travel. In our opinion, the research for induced travel new and not tested, and how to quantify this issue is not clear. The issue is related to the issue of secondary impacts, and consideration needs to be given to working with local communities and regional planning commissions along the lines of land use implications.

Rich Roach.

Can I suggest a graphic that I think might be constructive, I don't know how accurate it will reflect what you are talking about. Seemingly, we have an unlimited pool of employment and population in Boston. It might be helpful to have a graphic that shows a boundary around I-93 that would include the area within one hour's travel time of Boston, assuming average rates of speed during the commuting hour. A second and third boundary could be also shown for 75 and 90 minutes, respectively. These areas would show the locations for today where the development might occur, and where people would more likely be included to move to because they are within commuting distance (assumed to be one hour in time) of Boston. If you then improve I-93, the improved travel time will extend the commuting range into the 75 and 90 minute areas, and it is these new areas that are likely to be subjected to secondary impacts as a result of the highway improvements. As Linda Wilson suggested, Manchester is about the limit where you can live in NH and commute to Boston. If the highway is to be widened and travel times improved, then there will be increased pressure on communities currently beyond the influence of the Massachusetts commute. This graphic would allow people to have an idea if the widening would make a difference to their town.

Mike Fitzgerald.

I take some exception to the characterization that the study of the phenomenon of induced travel is new. I think that the Office of Mobile Sources and staff within the EPA have conducted studies where they have reviewed historical studies going back 20 years. Induced travel is pretty

well documented and is anticipated to increase over and above the population growth increases and result in an additional 10% of the projected VMT's. Others would claim significantly higher; but that was EPA's conclusion. I think there is information there. Also EPA indicated to us on a recent teleconference that they were developing methodologies to work with MPOs to account for induced travel in their conformity analyses. I think there is information out there to quantify it and to separate it from what it would be considered normal growth patterns and I think these methodologies need to be looked into.

Marty Kennedy. For example, the paper that the EPA forwarded, has that paper itself gone through a critical review by the profession? Typically, the way research is conducted, you do your studies, and then over several years the research goes through a process where different professions critique it.

Rosemary Monahan. That paper has gone through some peer review, and I also disagree that the issue is not widely accepted. The fact that FHWA has posted on their public website a method for estimating induced travel, suggests that they accept the legitimacy of this phenomenon. What we are really talking about is how much. Studies indicate that for every 10% increase in highway capacity, you might get as much as 2% to 5% increase in induced travel in the short term. So for I-93 there might be a 25% increase. We could be talking significant numbers. What seems reasonable to me, is not to spend a great deal of time and money studying this issue but instead take some numbers that are being commonly accepted, assume perhaps that we are at the low end of the rates, (that is say 2%) and determine level of induced travel we might expect to see. I think that is reasonable. Look at a range of numbers over the short term and long term. It would seem important to know if we spend the money to widen the highway, how much of a congestion is it really going to fix? It gets to the question, is the widening really going to solve the problem, and it also helps figure out how much of the ridership is going to be on alternative forms of transportation if they are provided as part of the project.

Marty Kennedy. What you suggest can be done. We can use the different inputs, and calculate ranges of induced travel. I'm not sure how legitimate the results will be relative to drawing conclusions about the project, but we can talk about potentials and ranges.

Rosemary Monahan. The thing that worries me is that if the analysis is delayed until later in the process, it may be too late to affect the ridership analysis and the mode choices that will be made soon. It seems like we should be looking at the different ranges of induced travel, whether it is 2%, as they affect the ridership splits. If we are not accounting for induced travel, we are not accounting for possible congestion and possibly underestimating how many people might take alternative forms of transportation. What is the plan for when you will start evaluating induced travel?

Jeff Brillhart. I don't think there is one. I have read the literature you forwarded as well as other papers on this issue. The Department has conferred with VHB on this issue. We have taken a serious look at the issue. From my perspective, this is a new issue. The phenomenon has obviously been around for a long time, but the idea of it is relatively new and quantifying it is very questionable. I feel there are great differences of opinion on what induced

travel means, and how much it has been accounted for with current modeling techniques. My sense is, when all is said and done, that it is not going to make a difference as to what we need to do for I-93. In fact, if induced travel means that our numbers are low, I suppose the inferences is we need to do more in terms of widening the highway. I think we need to accept the numbers developed, and we need to make the decision makers (including the regulatory agencies and the representatives of the people of NH that determine the transportation program) aware of the fact that if you improve I-93, there are ramifications that extend beyond the immediate area of impact. They are called secondary impacts and we need to make people aware of them. We can spin our wheels going back and forth on what the actual numbers are, but I think the concept we need to get across is that there are secondary impacts associated with widening a highway. We at the Department recognize this. That is my recommendation to the Commissioner is that this is too new for us to really get a handle on and ultimately it falls into the question of secondary impact. What is the Department going to do about secondary impacts. I don't know how the issue of secondary impacts will be addressed, but I do know that it is the other major issue of this project. We are working with FHWA and VHB to come up with a methodology.

I'd also like to point out that when we talk about this project, this is not just a NHDOT project, but in fact it is all of our project. We have a highway that has big problems and it has had these problems for a long time and we need to address them in a reasonable manner that will result in meaningful improvement.

Rosemary Monahan. Our greatest concerns are the secondary impacts and one of the things that we talked about very briefly was looking at different methodologies of being able to estimate those secondary impacts. What is important is that whatever happens on I-93, the communities are ready for it. I think, most often, highway projects are thought of as traffic congestion relieving projects, but they only do that to some extent, for induced travel reasons and a number of other things. What the highway projects really do is reshape land use and I think that is the history since after WWII. Highway projects have a strong influence on land use and most transportation models in the past, because it is such a complicated thing to do, haven't really taken into account secondary impacts. There is a National Transportation Research Board report on land use and impacts and this report provides different methods that can be used to address the issue of secondary impacts. Some analyses are a lot cheaper and quicker than others, and cheaper and quicker is OK with the EPA. Maybe we can talk about that at another meeting.

Jeff Brillhart. It is not an easy subject. It also needs to be kept in mind that secondary impacts do not necessarily result in bad impacts. The building of I-93 has altered the face of NH, but much of what's taken place has been positive. We need to try to minimize the downside to fixing the highway as much as possible, but we also need to recognize there is an up side as well. The fact is people, whether by car or whatever, like mobility and we need to try and accommodate them.

Rich Roach. I just think the National Environmental Policy Act requires that we attempt to consider secondary impacts and inform the public as to the implications

of the proposed project. The Act did two things: (1) it required that we consider the environment on a par with the economic issues, it won't be just the economic issues that determine what is done; and (2) through this process we will involve the public in the decision making. Ultimately government agencies will make the decision whether to grant permit (I don't doubt the USACOE will grant permit and the EPA will have to make a determination as to whether they want to veto the permit), but the people will provide direction and an analysis needs to be done so the people can understand the situation. We will have to agree on the methodology to be used prior to doing the evaluation and then the evaluation will be included in the EIS so people can comment on it.

- Ken Kettenring. I would like to say that obviously there is a need, a real need to improve transportation in the area served by I-93. Personally, I think there is going to be growth in NH, and I would think that regardless of what form of transportation we use, there is going to be some induced impact. It doesn't matter whether it is easy to come by car or easy to come up by train, in both cases, there is going to be an increase in the desire to move into NH. It is important that whatever we do, we address the impacts so that NH can continue to be a place where you can afford to live and continue to be a place where it is nice to live. My major concern right now is that we are already focused on one answer which is four lanes. I am not convinced that the alternatives produced thus far cover all the alternatives that might address the problems of I-93, which is not to say induced travel is not important, but any improvements to the transportation system will result in induced impacts all creating similar problems.
- Butch Waidelich. It was stated that there is not a broad enough spectrum of alternatives. There is some planning being given to the I-93 corridor relative to keeping the median available for other transportation options. Are there other alternatives that you have in mind?
- Ken Kettenring. One that I have raised that has not been studied is the concept of upgrading the East Rail corridor to a high speed rail line as opposed to assuming that it could only go 60mph. My point is not to focus just on this alternative, but that there are a lot of different possibilities that perhaps, with a little bit of study, could be shown to be impractical or unacceptable, but at this point, it isn't clear to me that they are ready to be discounted.
- Kate Hartnett. It seems to me that density is the real focus here. It is important for this project to address mobility and safety. However, we need to be more creative to arrive at the best solution. From my perspective, up to a certain point increasing the amount of road miles decreases the amount of congestion. But as I look around the country I see that at some point we reach the top of an "L" shaped curve where mobility continues to decrease even though road miles might increase. That is where alternative transportation options have to come into play. I just don't know when that point in the curve is reached?
- Jeff Brillhart. I don't know either. There seems to be this idea that because Federal Highway is funding this project, it is pre-ordained that we build four lanes in each direction. That is not true. When we started this ridership study, it was not clear what the analysis would result in. Had the analysis results indicated that trains would solve the capacity problem of I-93, I don't

know what the Commissioner would have done. Perhaps we'd propose to do some geometric improvements around the interchanges to address safety problems and leave the capacity to be solved by the train. It would have been an interesting turn of events, because it would have shown that the Department, who pride themselves on having some idea about transportation and where the real needs are, had it wrong in suggesting that the solution involved widening the highway.

The Department has approached the project with the idea that will likely be the last time that major improvement will be constructed on this section of I-93. Therefore, we need to fix the highway, but we need to do in a way so that we don't preclude other opportunities in the future. The Department believes very strongly that the days of widening highways are nearing an end. In effect, the Department has taken it upon itself to say we have reached the peak of the "L" shaped curve with whatever we do in terms of widening the highway. This is probably it for all of us in our lifetime and our kid's lifetime as well. Whatever we come up with for highway improvements we need to try and accommodate other means of transportation, at least in a planning sense, so that we have the opportunity for rail in the future, and an opportunity for buses in the future. As Butch Waidelich suggested, we don't want to widen the highway, in the median and not have an opportunity to put rail there; or put a rubber tire bus system or something else that we haven't even thought of.

I think we need to keep focused on the highway because that is the problem and that's been the Department's charge through the State's 10 Year Transportation Improvement Program. Everyone has been waiting for 10 or 15 years anyway for this thing to get going and they are very anxious to get it going. The expectation is this road needs to be fixed, and from the Department's perspective, we need to fix it and we need to fix it with the idea that we don't preclude other transportation opportunities. The next time around when we are looking for more capacity, we are going to be looking at trains. They are coming. That appears to be the new reality. The Department is very aware of this and is working very hard to facilitate this new reality and getting the word out. Highways will not address all our mobility needs.

Leigh Komornick.

I was involved in the NH 101 project, and during the preliminary phase a great deal of time and funding was spent trying to work with the affected towns to implement zoning ordinances and regulations to head off poor land use. I'm not sure it had much of an affect relative to secondary impacts.

Peter Griffin.

The I-93 corridor table shown is very interesting. A couple of things to consider. The I-93 median project is only a few miles from the existing through commuter service on the Lawrence line to Boston and you proposed to run a project down the median just to Woburn where another train would go into Boston. Secondly, have you looked at the cost of the infrastructure for the median strip project and compare it to the cost of double tracking the line from Andover to ??? or Wildcat or both? Economics would make the double tracking much preferred, and you would solve the problem of providing through service to Boston on the Manchester and Lawrence line and/or along rail line in the median of I-93 and then cutting over. Thirdly, do any of the figures reflect the ridership from Methuen? Methuen is on the Manchester and Lawrence line and I

know that they have been looking at rail service off and on over the past 10 or 15 years.

David Wilcock.

We are aware of the Methuen ridership but that is not part of this study. Relative to building a rail system down I-93 with a transfer to Woburn, that is a problem. However, continuing the I-93 Rail Corridor along I-93 in Massachusetts provides service for people in southern NH homes to work places in northern MA. We have identified 18 primary work places along the I-93 corridor. One of them is River Road in Andover, where 20 to 25% of the employees have southern NH addresses.

George Sioris.

From 1980 to 1990 Derry's population increased by 11,000 people. I am all for the train (it should go to the airport and not through the Town) and all for the widening of the highway. The people who live in Derry are very much a reflection of the commuter cross section along I-93. They are very high tech and not all of them are going to downtown Boston. The highway needs to be widened to accommodate the traffic that is increasing in volume. We need to address the safety. There are many accidents that are putting severe pressure on our municipal resources. A lot of development is occurring in Chester because of regulations in Derry, limiting development in Derry.

Roberta Robie.

This highway corridor is the Gateway to NH. This segment creates an hour glass effect as the sections to the north and south have more lanes and the traffic has to squeeze through this narrower segment. Traffic accidents are very high. Since the last RA meeting, we had six accidents in one day along this section. Accidents are ongoing. It is a safety issue that we've been aware of for over ten years.

As far as the sprawl issue goes, NH has experienced sprawl even without the widening of this highway. Widening this highway is not going to increase sprawl in my opinion. They are coming anyway, and it is the responsibility of each community to address that issue. Also, we have been discussing commuter traffic but we haven't touched upon weekend traffic. Alternative transportation is not going to address the weekend traffic situation. NH is a great tourist attraction and that traffic is going to stay on the highway.

Jeff Brillhart.

We are going to have a Task Force Meeting on November 9 at 6:00. We are in the process of setting up a Second Scoping Meeting for December 6, 2000.